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(71) Applicant: **KENWOOD CORP KENWOOD DEVICE:KK**

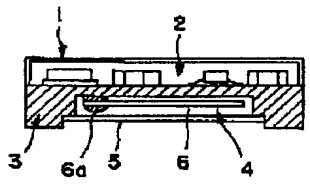
(72) Inventor: **TAMURA SHIRO**
KATANO GIICHIRO
YOKOTA KOJI

(54) TEMPERATURE COMPNESATED CRYSTAL OSCILLATOR

(57) Abstract:

PROBLEM TO BE SOLVED: To make the size small by integrating a crystal vibrator and an oscillation circuit.

SOLUTION: A vibrator sealing chamber 6 is provided to a rear side of a multi-layer ceramic base 3 and a crystal vibrator board 4 is directly mounted via a mount 6a and a cover 5 is used for air-tight sealing. A print picture for an oscillation circuit and a circuit element 2 are arranged to the front side of the board 3 and they are covered by a case 1 with an adjustment hole. The board 4 is air-tight-sealed and after its transmitter versus frequency characteristic is measured, and electronic components for the oscillator are mounted in matching with the characteristic. Thus, the temperature versus frequency characteristic of the crystal vibrator is independently measured and the crystal vibrator with high precision is manufactured. Since the board 4 is separated from the circuit pattern and the circuit component 2, high stability is attained and the board 4 and the oscillation circuit are integrated to attain low cost.



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(71) Applicant: **MATSUSHITA ELECTRIC IND CO LTD VICTOR CO OF JAPAN LTD**

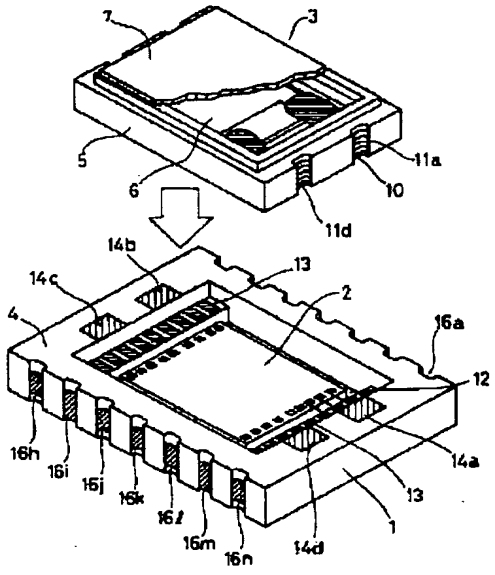
(72) Inventor: **KONDO SHUJI**
SATOU HIROKI
SUZUKI MITSUO
KIMURA AKIO

(54) **OSCILLATOR**

(57) Abstract:

PROBLEM TO BE SOLVED: To provide an oscillator, wherein an organic substance of a bonding agent for fixing an active element does not stick to a vibrator element, and when the active element or the vibrator element is damaged, a non-defective item can be reused.

SOLUTION: An active element 2 is mounted inside the first vessel 1 whose upper surface is opened, and the opening part of the first vessel 1 is closed up with a vibrator unit 3 which contains a vibrator element 6. By attaching the vibrator unit 3 to the opening part of the first vessel 1, the second connection electrodes 11a-11d of the second vessel 5 of the vibrator unit 3 are connected electrically to the first connection electrodes 14a-14d of the first vessel 1. With the vibrator element 6 and the active element 2 being housed in separate vessels respectively, an organic substance of the bonding agent for fixing the active element does not stick to the vibrator element 6. When the active element 6 or the vibrator element 2 has been damaged, by separating the first and second vessels 1 and 5 non-defective items can be reused.



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(71) Applicant: TECH RES & DEV INST OF JAPAN DEF AGENCY
TAMAGAWA SEIKI CO LTD

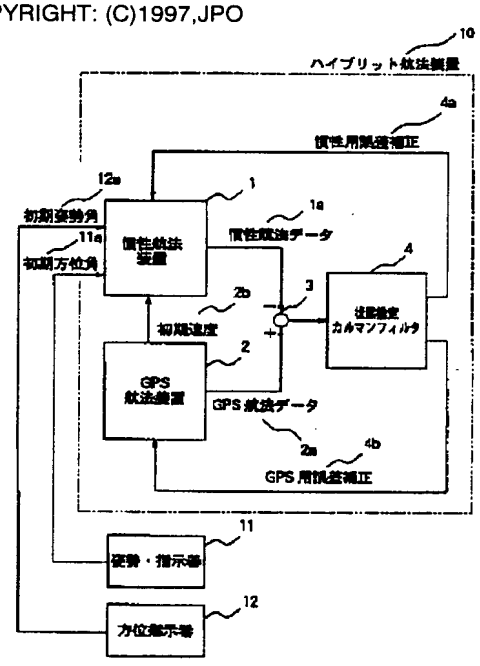
(72) Inventor: ONOKI TAKEHIRO
KIYOOKA TADASHI
KUMAGAI HIDEO
KITAHARA KAZUHITO

(54) **SETTLEMENT COMPUTING METHOD DURING MOVEMENT OF INERTIAL NAVIGATION DEVICE**

(57) Abstract:

PURPOSE: To obtain a settlement computing method in which a settlement is performed with high accuracy and in a short time by a method wherein an attitude angle from an attitude indicator loaded on a moving body, an azimuth angle from an azimuth indicator and a GPS speed from a GPS navigation device are input to an inertial navigation device as initial values.

CONSTITUTION: Inertial navigation data 1a from an inertial navigation device 1 and GPS navigation data 2a from a GPS navigation device 2 are added, subtracted and processed by an adder-subtracter 3 so as to be input to a status estimation Kalman filter 4. An error correction 4a, for inertia, which has been processed by the filter 4 is input to the device 1, and an error correction 4b, for a GPS, from the filter 4 is input to the device 2. An initial speed 2b from the device 2 is input to the device 1, and a hybrid navigation apparatus 10 is constituted of the devices 1, 2 and of the filter 4. The apparatus 10 is loaded on a moving body such as a flying body or the like, and an initial attitude angle 11a and an initial azimuth angle 12a from an attitude indicator 11 and an azimuth indicator 12 which have been loaded on the moving body are input to the device 1.



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H03H 9/10

(21) Application number: **11072352**

(22) Date of filing: **17.03.99**

(71) Applicant: **NIPPON DEMPA KOGYO CO LTD**

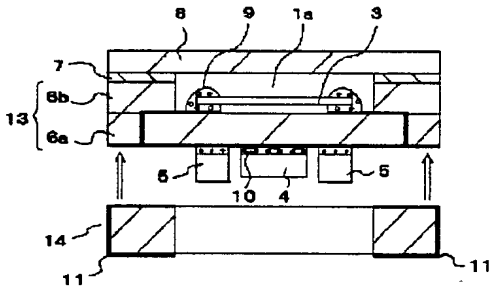
(72) Inventor: **ODA SEIJI**
KOSHIKAWA TOMOMI

(54) SURFACE-MOUNTED QUARTZ OSCILLATOR AND MANUFACTURE OF THE SAME

(57) Abstract:

PROBLEM TO BE SOLVED: To make facedown bonding of an IC chip eas by mounting a crystal piece on a main surface side of a ceramic base, fitting the IC chip on a back side with the ceramic base as a planar surface and providing a frame body that has a terminal for surface mounting on a back side of an outer periphery of the ceramic base.

SOLUTION: A surface-mounted oscillator consists of a ceramic base 13, which has a recessive part 1a only on one main surface side and a lower substrate frame 14 consisting of, for example, a glass epoxy substrate. The ceramic base 13 is constituted by laminating a bottom wall 6a and an upper part frame wall 6b and is integrally formed by burning. A quartz oscillator is completed and an IC chip 4 provided with a pump 10 is fixed on the back side of the quartz oscillator by facedown bonding. Also, a chip element 5 is fixed by a conductive adhesive material. Next, the lower part substrate frame 14 is connected to the back side outer periphery of the ceramic base 13.



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(11) Publication number: **2000252747 A**

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(21) Application number: **11054292**

(22) Date of filing: **02.03.99**

(71) Applicant: **NIPPON DEMPA KOGYO CO LTD**

(72) Inventor: **OITA TAKEO**
ASAMURA FUMIO

(54) CRYSTAL OSCILLATOR AND ITS MANUFACTURE

(57) Abstract:

PROBLEM TO BE SOLVED: To constitute a surface mount type crystal oscillator thin and to facilitate temperature characteristic adjusting operation by providing a case- contained crystal vibrator fitted to a flexible substrate, electronic components fitted on the other surface of the substrate, and a rigid frame body which is adhered to the other surface while surrounding the electronic components, etc.

SOLUTION: One flexible substrate 1 having wiring patterns formed on both its surfaces is used and the case-contained crystal vibrator 2 which is formed in a different process is fitted to its one surface, the electronic components are fitted to the other surface, and the outer periphery is surrounded with the rigid frame body 4 having a wiring pattern corresponding to the flexible substrate 1. Consequently, the crystal vibrator 2 and electronic components are mounted on the different surfaces of the flexible substrate 1 to the electronic components having effect on the characteristics of the crystal vibrator 2. Further, the case-contained crystal vibrator 2 which is manufactured in the different process and has its function guaranteed is used, so defects caused when the crystal vibrator 2 is fitted can be reduced.